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ABSTRACT

This guidebook, aimed at middle-level policy advisors and planners in education, suggests a methodology that can be used to monitor progress in the implementation of Education for All (EFA) programs regardless of the proprieties and targets involved at the national level of the individual country. The first chapter discusses the decision to implement an EFA program and the kinds of indicators that can be used to measure progress. The legal framework and enforcement possibilities are also discussed. The second chapter focuses on monitoring, providing an overview of a monitoring system and its scope. Chapter 3 considers strategic plans of action and a logical framework methodology. Chapter 4 focuses on the development of a monitoring model, whether static or dynamic. The final chapter discusses implications and linkages required to ensure adequate planning, training, and information and communication requirements. (SLD)

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A METHODOLOGICAL GUIDEBOOK

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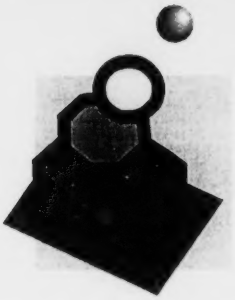

Monitoring Progress Towards Education for All

A METHODOLOGICAL GUIDEBOOK

UNESCO PRINCIPAL REGIONAL OFFICE
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Bangkok, 1998

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Preface

Building sustainable national capacities for the planning and implementation of a plan of action for Education for All (EFA) is a major challenge facing governments throughout Asia and the Pacific.

This guidebook is aimed mainly at middle-level policy advisers and planners in education. The purpose is to suggest a methodology, with sequential steps, that can be adopted and used in-country.

The focus is on the monitoring of progress in the implementation of EFA programmes, regardless of the priorities and targets involved at the national level. Monitoring must enable policy makers to check on progress and modify policy/strategies/targets accordingly.

- Different countries use different means to reach the EFA goals and objectives, for example, through expansion of primary education, distance education or non-formal education. The balance of delivery methods will vary according to context and need.
- This manual is concerned only with monitoring whatever program delivery methods are used. The focus is on monitoring targets and guidelines for policy development and modification.

Nevertheless, it is recognised that information on the quality of education, especially the achievement of learners, is also critical in the assessment of EFA progress. Improving the quality of education requires systematic monitoring of performance and achievement against pre-determined key indicators of progress.

The involvement of UNESCO in preparing this monitoring manual derives from its role in the 1990 World Conference on Education for All and in subsequent developments. Governments now have six years experience in implementation of EFA objectives. UNESCO is concerned to assist Ministries of Education in strengthening their capacity to assess and evaluate progress towards EFA targets.

The experience and practice of other agencies, notably UNICEF in the health field, has been tapped in the preparation of this guidebook. UNESCO is grateful for this input.

Feedback is welcome to assist in revision and improvement of this guidebook in light of national experiences.

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1. Introduction

1.1 Decision to Implement EFA

At the World Conference on Education for All, held in Jomtien, Thailand in 1990, governments adopted the World Declaration on Education for All and agreed on a "Framework of action to meet basic learning needs."

Four major target areas for EFA were identified:

- Early Childhood Care and Development (ECCD)
- Eradication of Illiteracy (EOI)
- Universal Primary Education (UPE)
- Provision of Opportunities for Continuing Education (CE)

These mainly reflect different clusters of age groups. Most national EFA programmes are concerned with UPE and, to a lesser extent generally, EOI. A slightly different EFA implementation strategy is required in different countries, especially those where the gaps in educational provision are most acute.

Information available six years after the World Conference indicates that in most regions

- primary enrolments are increasing
- the number of out-of-school children is declining
- the gender gap in primary enrolments has not decreased much
- dropping out remains a major problem
- conditions of service of teachers have continued to deteriorate in many countries

However, progress is difficult to assess owing to weak and incomplete data and the absence of a reliable system to monitor educational development.

Improved information, quickly and readily available, is necessary for a monitoring system of progress in achieving EFA targets.

1.2 Indicators

1.2.1 Definitions

Indicators are measures of individual and system performance along dimensions judged as important in planning and resource allocation.

- An indicator's measurement or value is reflected in a number, percentage or ratio.
- Indicators provide a glance or a snapshot of the current conditions.
- Indicators provide a broad reflection or a general indication of the state of the situation under investigation.
- An indicator can reveal something about the performance or behaviour of an education system and thus be used to inform decision-making.
- Some education indicators provide statistics that allow for judgements to be made on key aspects of the functioning of the education system.

A good indicator has the following characteristics:

- focuses on measurable dimensions
- describes central features of the education system
- is linked to the system's goals and purposes by providing a measure of progress
- is relevant to educational policy
- is problem oriented
- may have some predictive value
- is comprehensive
- is readily understandable by all major interested audiences
- is generally accepted as valid and reliable
- enables identification of trends over time
- is feasible to collect in terms of the time, expertise and cost required
- is available (i.e., measured, described, disseminated) on a timely basis

1.2.2 Classification of Indicators

The most common classification is of inputs, processes, outputs and outcomes:

- Inputs: real resources used in education; e.g., students, teachers, other personnel, curriculum, textbooks, facilities, equipment and the foregone earnings of students.
- Processes: the interaction between students and inputs, and among inputs, in the teaching/learning contexts and such factors as administrative characteristics.

- Outputs: the more immediate effects of education such as students graduated and increments to test scores.
- Outcomes: ultimate or eventual effects of education such as earnings, employment, contribution to productivity, improved health, decreased crime and other non-monetary outcomes of education.

A focus on inputs, as well as outputs, is likely in the initial monitoring of quantitative targets, although processes would also be involved.

1.2.3 Differentiation between descriptive indicators (descriptors) and performance indicators

This is an important distinction. Both kinds of indicators are needed and useful for monitoring EFA progress. Their relative utility will change over time.

Descriptive indicators measure simple identification at a point in time and over a time period. Examples include the number of trained teachers or female students.

To better understand the education system's progress (performance) to achieve specific targets by a certain time, a measure of the dynamics of the process is required. That is, to monitor progress toward some of the quantitative targets, it is necessary to measure the interaction of various components of the education system.

Performance indicators are different from descriptors.

- Performance indicators relate outputs to inputs and thus place more emphasis on the efficiency of the system and its processes.
- The values (measurement) of performance indicators are calculated by combining separately reported monitoring data; i.e., two descriptors.
- Examples are pupil/teacher ratio, pupil/classroom ratio, pupil/textbook ratio

The selection of indicators to monitor begins with the objectives, strategies and target goals of the national EFA plan of action. Without a specific plan of action with numerical targets and specified timelines, monitoring is not meaningful.

1.3 Quantity vs Quality

1.3.1 Differentiation

The differentiation between quantitative and qualitative assessment of EFA progress is important.

- All indicators are measured quantitatively; usually as a percentage, or a number to express the value of the indicator.
- All indicators measure quantity, but only some also reflect quality.

The term "quantity" refers to evidence of more, or less, of something that already exists. e.g., the proportion or total number of students who pass the primary leaving examination.

- At the time of the measurement (monitoring) the quantity reflects a numerical condition, e.g., number of students, teachers, costs, facilities, textbooks, at a specified time.
- Quantities can be an input, output or process (or outcome).

The notion of "quality" refers to the extent of possession of a particular attribute or characteristic of an educational indicator.

- A certain underlying value is assumed.
- As identified and defined, the indicator is said to have a certain quality which its value (measurement at a certain time) reflects.

Sometimes the distinction can be somewhat blurred. Indicators that are mainly viewed as quantitative can also reflect an element of quality of the education input, output or process.

For example, an increase in the proportion of trained teachers provides limited information about a changing quality of the teaching force. An increase in the number of trained teachers is taken to mean greater quality of education provision. However, a more useful reflection of quality would be to include an additional teacher attribute that can also be measured. This might be the number (quantity) of trained teachers who have a subject qualification. Such a quantitative measure says more about quality than what could be derived from a mere percentage of all teachers.

When considering EFA, it is important to collect data to determine both quantitative indicators that measure progress towards EFA targets as well as qualitative assessments (values) that describe explicitly the achievements measured by or reflected by the solely quantitative indicators.

However, it is useful to measure quantitative changes such as progress towards numerical targets, even if they reflect no change in the quality of educational provision. Hence the monitoring of progress toward quantitative targets has a limited though nonetheless important role.

Although in most countries a comprehensive system of quality of education indicators has yet to be developed, its importance must be stressed. In other words, although quantitative assessment is a necessary measure for monitoring EFA targets, this is not by itself sufficient to assess EFA effectiveness (goal attainment), much less efficiency (cost). However, the costs of developing and implementing such quantitative and qualitative monitoring systems are a realistic constraint to what can be achieved.

A monitoring system should start from a simple base with the selection of only a few essential indicators that are straightforward in their identification and comprehension. In many countries this selection would probably start with the regular school census.

1.3.2 Examples of quantitative (descriptive) indicators

All indicators are measured quantitatively. Only a few examples are provided here, relevant to the focus of this guidebook on the monitoring of quantitative targets in EFA programmes.

Inputs:

Student enrolments (per cent, including of females)

- gross enrolment rate
- net enrolment rate
- average daily attendance

Costs

- expenditure per pupil - by level and urban/rural
- Facilities and equipment - by level and urban/rural
- libraries
- classrooms

Textbooks - by level and urban/rural

- issued to students
- available in school library

Process

Drop-out
Repetition

Outputs:

Student progression

- by gender
- by grade level,
- urban/rural.

Examination passes

- by grade level
- by gender

1.3.3 Examples of qualitative (performance) indicators

Some indicators also reflect quality in the education system.

Inputs:

Teachers

- trained
  - pre-primary
  - primary
  - secondary
- shortages
- surpluses
- pupil/teacher ratio

Process:

Hours of study in class
Absenteeism (pupils, teachers)
Use of teaching aids

Outputs:

Examination passes

- by grade level, or expenditure per pupil

A comprehensive set of indicators to monitor progress to EFA targets is contained in Section 4 of this guidebook.

1.4 Moving Targets

To monitor quantitative indicators of the EFA plan of action is to monitor progress towards targets that are numerical goals. EFA refers to two overlapping target groups:

- *Education*: Students in the system (formal and non-formal), and
- *All*: individuals in the total population who need education.

Thus, while monitoring the number of students in the formal school system may indicate progress in the sense of an increasing number of students, does this necessarily mean progress towards the target of education for all? The answer to this question requires the increase in student numbers to be compared to the increase in the student age cohort through population growth, together with the "backlog" of older individuals who have had schooling. Thus it is possible to experience an increasing number of formally enrolled students while falling behind in the objective of education for all. This moving population base therefore necessitates the use of relative definitions for targets. Rather than simply students enrolled in schools, net and gross enrolment rates are necessary to monitor progress toward EFA.

The first task in introducing a monitoring system is to clearly identify the educational objectives, adequately defined targets, strategies, and concrete tasks and actions to be performed and the schedule for accomplishing these.

The process of monitoring then allows comparison of actual achievements and targets. Differences between targets and achievements are used as feedback to modify policy, change strategies, mobilize additional resources and/or change targets.

1.5 Outdated Information

Outdated information often arises due to an inadequate capacity not necessarily to generate data, but to process and use it.

The problem is partly due to the long lead time in the stages of data collection, analysis and interpretation. The results of analyses tend to appear long after the data collection phase and it often takes years to disseminate information on the findings from monitorings. For educational goals where timelines are important, such as the Jomtien 2000 declaration, such delays make monitoring the effectiveness of policies almost impossible.

A great deal of education data derives from the regular school census conducted by the Ministry of Education. The resulting information reports on education system performance are frequently outdated. Even when data have been analyzed, the information generated may not be easily available to practitioners or researchers outside the top levels of the Ministry of Education. Mechanisms for collecting and analyzing recent data are further discussed in Section 4.

1.6 Too Much Information

Some monitoring efforts have not succeeded owing in part to the generation of massive amounts of information, often much more than can be used. The long lead time between the collection of data and report preparation is partly caused by the problem of too much information generated.

The main reasons for this problem are:

- collecting data that might be used instead of data that will be used
- lack of clear objectives in advance about what kind of data should be obtained
- under-staffed offices and ill-trained personnel, along with a lack of capacity to use available technology
- absence of computers at the school level to help analyze information, especially enrolment data
- limited ability of school heads and teachers to manually collect, consolidate and transmit data

Generation of too many data usually leads to higher monitoring costs, yet an increase in information is often of declining marginal usefulness. Ironically, as information from monitoring is often late in reaching senior decision-makers, statistics and information are often sought more frequently. The issue of too much information may increasingly arise owing to the growing capacity to use information technologies.

Large amounts of information are also often the result of monitoring mechanisms relying on school census data. In countries with large populations, the resulting database can be almost unmanageable. Owing to the need for reasonably recent information, available as soon as possible, and the possibility of seeking an abundance of information, it is imperative to focus only on appropriate areas for monitoring. Monitoring for policy development is an activity which is different from that served by the school census process. Section 4 discusses alternatives to using the school census database for monitoring purposes.

1.7 Legal Framework and Enforcement

An understanding is needed of the overall legal framework governing the provision of education in the country, especially as it concerns the EFA programme. The varying monitoring responsibilities of sub-national jurisdictions and the relationship between them must be clearly understood. This includes laws and related administrative discretionary powers of the central Government (ministers and senior officials) and, as applicable, other levels of Government; regional, provincial, state and local.

Awareness of the legal framework is also needed concerning educational provision undertaken by private agencies and organizations.

Major elements of the existing legal framework are:

- authorities and responsibilities for educational policy and provision
  - Ministry of Education
  - other central Government ministries, e.g., Finance
  - sub-national jurisdictions, including local governments
  - private organizations
- financing and related provisions
  - accountability for capital and recurrent grants
  - auditing
- teacher training and certification
- regulatory and advisory bodies
- education statistics and research
  - collection of data
  - responsibilities of principals, teachers, inspectors
  - processing and analysis
  - interpretation
  - dissemination of information and publication
- administrative and financial records and reports
  - inspection reports
  - research papers
- Access to other data, e.g., from population census, household surveys, labour force surveys, sectoral reviews

An assessment should be made of the extent to which the relevant laws and administrative regulations are in fact enforced. For example, some countries have a law that says education is compulsory to a certain level but this law may be enforced only slightly or not at all.

2. Monitoring

2.1 Overview of a Monitoring System/Process

2.1.1 Definitions

The principle objective of a monitoring system for EFA is to develop a frequent, quick effective means for collecting information and reporting on the progress of implementation.

Monitoring can be defined as the periodic implementation of an activity which seeks to establish the extent to which input deliveries, work schedules, other required actions and targeted outputs have been proceeding according to plan, so that timely action can be taken to correct deficiencies detected.

Thus the first task in introducing a monitoring system is to clearly identify the educational objectives, adequately defined targets, strategies, concrete tasks and actions to be performed, and the schedule for accomplishing these.

The process of monitoring then allows a comparison of actual achievements and targets. Differences between targets and achievements are used as feedback to modify policy, change strategies, mobilize additional resources and/or change targets.

Monitoring is periodic or regular or both. It involves focussing on inputs, outputs and process activities. It can involve routine or sentinel systems, field observation, progress reports or rapid assessments, and often leads to adjustment of work plans.

Monitoring is the observation of

- the transformation of inputs and activities into outputs; and
- the effectiveness with which the outputs result in the achievement of project purposes.

2.1.2 Sources of data

The selection of data for education monitoring has traditionally relied on several sources or "data channels."

- The main data sources are: school censuses/surveys, administrative records (e.g., attendance), reports by school inspectors, admissions tests, examination results, and financial records.
- Routine records, both administrative and financial, are at the heart of a monitoring system.
- Information from the administrative, teaching and ancillary staff forms an important input for monitoring purposes.

Other possible sources include population censuses, household surveys, labour force surveys, sample surveys and tracer studies.

Ways to obtain data are:

- make maximum use of existing data and data sources
- collect additional data using the existing data system and sources such as school surveys, population census, household surveys and government budget documents
- open new data channels

2.1.3 Management responsibility

Monitoring is an integral component of the management of education.

- Monitoring provides an overall management approach to check progress at all levels in relation to objectives, deadlines and progress.
- Information for tracking progress according to previously agreed plans and schedules is routinely gathered. Discrepancies between actual and planned implementation can be identified and corrective actions taken.
- Monitoring measures the implementation efficiency of a project: how inputs and activities are translated into outputs. This form of input-output monitoring focuses on the achievement of outputs compared to the availability of project resources.
- Monitoring is also useful for systematically checking a condition or set of conditions within the education system, such as the situation of women and children.

2.1.4 Audiences/clientele

Different groups within the education system have different information needs that a monitoring system meets:

- Central Government and regional/state and local policy-makers and planners are concerned with the whole system or that part within their jurisdiction.
- Teachers want to know about their students' progress as compared with other groups of students.
- Parents, as consumers of education programmes, also want to know about access and achievement, as assessed in examinations, and the quality of schooling received by their children.
- Research bodies and international agencies are concerned with educational progress in a particular economic, political and social context.

Monitoring at the district or village level must be closely identified with and support the local school situation, and not be seen as an "external" intervention. School principals and teachers already have heavy work loads. When asked to complete forms and otherwise contribute to the monitoring process they must believe that its findings will be useful and useable to them.

2.1.5 Uses of monitoring data

At a minimum, monitoring reveals trends in indicators over time and can enable projections based on these trends. However, monitoring when linked to targets and strategies through appropriate design can be used to provide feedback for the fine tuning of objectives, in this case, achievement of progress toward EFA.

Indicators of education can measure progress in the implementation of quantitative and qualitative targets in the national EFA plan of action. Each target has associated with it a timeline for success. Depending upon the frequency of the monitoring system, targets may be short-term, medium-term or long-term.

2.2 Why Monitor?

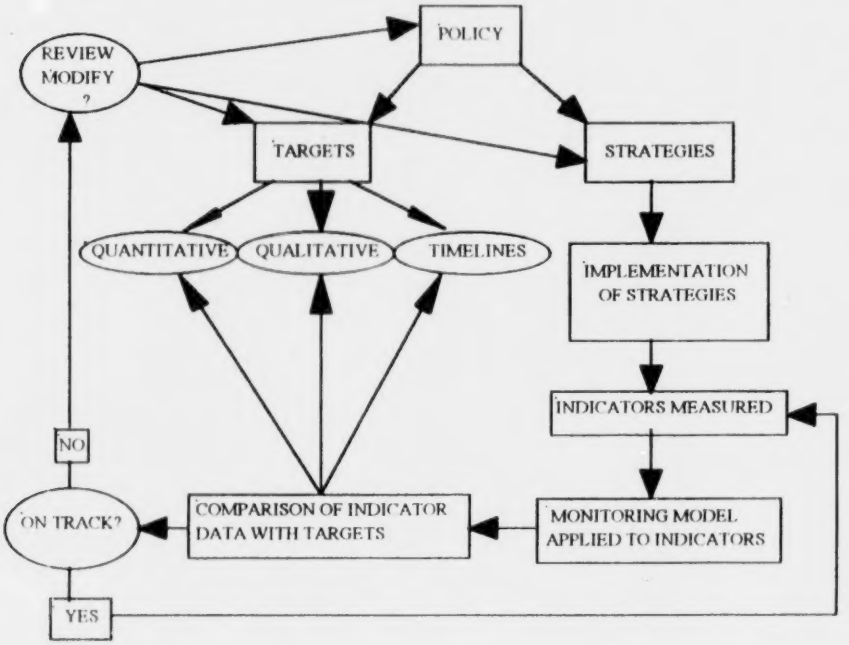
2.2.1 Accountability

Ministers of Education and their senior advisers are responsible for the implementation of the EFA plan of action and therefore require reliable and up-to-date information to monitor progress.

EFA programmes represent a significant share of public expenditure on education. Thus they need to be monitored and held accountable.

- There is a widespread perceived need to improve the performance of the public sector in general and school systems in particular.
- Monitoring assists such accountability of Government activities.
- Monitoring can help interaction among different departments of Government involved in EFA programmes.
- The ability of officials and policy-makers to analyze critical issues depends on the existence of a monitoring system that collects pertinent and current data based on accepted indicators.
- Use of indicators in some countries suggests that indicators can be a key tool to help improve educational performance.

Figure 1: Relationship between monitoring and policy



2.2.2 Feedback to decision making

At the national level the main aim of a monitoring system is to provide decision makers and planners with an overall picture of the EFA situation and its trends. This is done by:

- determining the extent to which EFA targets and objectives are being achieved and whether adjustments are required to plan EFA implementation
- informing management of the status of ongoing activities and helping facilitate early action to address identified or impending problems in implementing EFA
- identifying weaknesses and solutions, and deciding which activities should be increased and which reduced

Improved information availability to decision-makers is a key element in improving day-to-day educational management and thus the efficiency of education. Lessons of implementation can be identified and incorporated into future programming activity.

2.3 What to Monitor?

As discussed above, monitoring involves numerical targets, indicators and timelines. Figure 1 indicates that a policy (consisting of goals, purposes and desired outcomes) on EFA will enable planners to determine strategies (to be implemented) and set numerical targets (to be reached), both of which are to be achieved within pre-set timelines. The answer to the question of what to monitor is thus related to the Strategic Plan of Action. A well-developed and detailed plan of action will clearly describe what is to be monitored since the plan of action identifies the means by which outputs are to be *objectively* verified. The emphasis on "objectively" verifiable indicators deliberately points out the need to use numerical indicators. A poorly detailed plan of action will cause greater difficulties for monitoring because no direct link between inputs and outputs will have been planned. Thus the importance of a well-developed strategic plan of action has a great impact on deciding what to monitor.

An effective plan of action will verify outputs and activities using three components: quantity (1.5% increase in enrolment); quality (among girls in rural areas); and a timeline (within the next two years). In such a case, it is a straightforward matter to determine what is to be measured, how it is measured, and when it is to be measured. Strategies are usually developed which assume a causal relationship between inputs and outputs. Inputs are provided to an educational context, these are put to use (processes) and certain outputs are expected. Thus monitoring for policy development and fine-tuning requires indicators which measure inputs, processes and outputs. In the larger context, more general socio-economic outcomes might also be measured.

Figure 3 (Section 4.2) provides a schematic breakdown of these different types of indicators and Table 2 (Section 4.3) provides a classification of possible indicators.

2.4 Scope

EFA encompasses a huge range of the education environment. Universal Primary Education (UPE) varies in definition among countries but in all cases includes at least a component of primary education. In some countries, lower secondary education is also included in the definition of UPE. Eradication of Illiteracy (EOI) includes as a target group all those people who are illiterate. It includes children who are out of school and adults who did not have access to schooling. For the majority of countries, both UPE and EOI use formal and non-formal approaches. Continuing Education (CE) programs aim to provide people with further opportunities for study. CE also emphasizes the link between education and the world of work. Children have difficulty in learning in formal and non-formal settings if their development has been difficult. Early Childhood Care and Development (ECCD) is thus important if real gains are to be realized from sending children to school. In all the cases described above, both the private and public sectors have a role to play. In some cases, their contribution overlaps, in others it is complementary.

The scope of monitoring is therefore large and complex. Given the need for frequent and quick turnaround of monitoring information for policy modification, an appropriate monitoring model needs to be identified. Such a monitoring model needs to encompass the areas outlined above while at the same time quickly providing accurate and up-to-date data that enable policy makers to modify and fine-tune targets and strategies. Such a monitoring model is described in Section 4 below. However, the close linkage between the monitoring system and the strategic plan of action requires as a first step a description of a strategic plan of action since the monitoring system evolves out of such a plan.

3. Strategic Plans of Action

3.1 Setting Goals/Targets with Timelines

Unless specific goals and targets with specific timelines are specified as part of the plan of action, accurate monitoring is not possible. Furthermore, senior personnel develop policy to provide inputs in the form of resources such as funding, teachers, buildings or mobile training teams with an expectation that certain outputs will be achieved. Such outputs may be increased enrolments, greater access to schools by girls or better teachers. Provision of such resources occurs in specified ways according to a strategy developed by these policy makers.

Therefore, a plan of action needs to link inputs to outputs and provide objective means whereby strategies for making these linkages can be monitored and evaluated. The Logical Framework ("logframe") approach is one methodology that is used by many international agencies and educational project designers.

There are some advantages to using this approach:

- It ensures that fundamental questions are asked and weaknesses are analyzed in order to provide decision makers with better and more relevant information.
- It guides systematic and logical analysis of the interrelated key elements which constitute a well-designed project.
- It improves planning by highlighting linkages between project elements and external factors.
- It facilitates common understanding and better communication between decision makers, managers and other parties involved in the project.
- The use of the Logical Framework and systematic monitoring ensures a continuity of approach when original project staff are replaced.
- As more institutions adopt the Logical Framework concept, it facilitates communication between governments and donor agencies.
- Widespread use of the Logical Framework format makes it easier to undertake both sectoral studies and comparative studies in general.

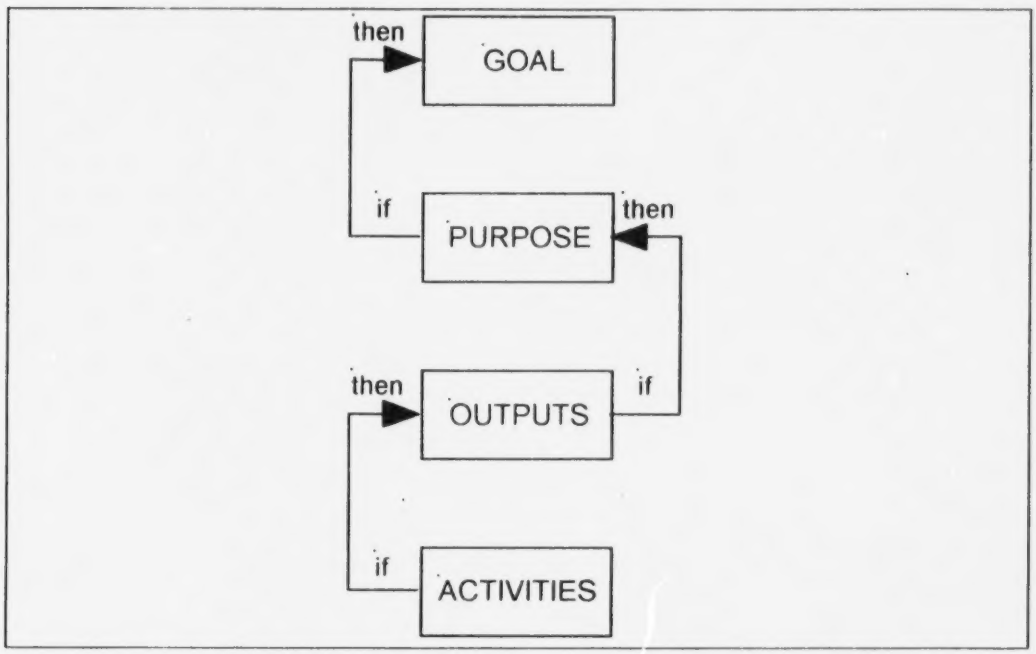
The major limitation of the logframe approach is its rigidity. However, this shortcoming can be minimized by regular reviews of the plan during which key elements can be re-evaluated and adjusted. The Logical Framework is a general analytical tool and is policy-neutral on questions of income distribution, employment opportunities, access to resources, local participation, cost and feasibility of strategies and technologies.

3.2 The Logical Framework Methodology

The logframe technique helps to identify the elements of a project and the linkages between them in a logical, concise and objective manner. It allows a project design to be developed with a hierarchy of objective statements regarding the goal, purposes, outputs, activities and inputs.

The main concept underlying the Logical Framework is cause and effect. The better the cause and effect linkages between objectives are described, the better the project design that is produced, and consequently the easier it is for monitoring to take place.

Figure 2: Cause and effect – the core concept of the Logical Framework method



By definition, each project has this "if/then" or cause and effect logic embedded within it. For example, IF we supply remote towns with schools and teachers and ASSUME that parents want education for their children, THEN enrolments in school will increase. This example demonstrates that assumptions must be considered. In all projects, certain events are not under the control of planners. The achievement of objectives depends on whether these assumptions hold true. However, the Logical Framework makes these assumptions explicit and activities can be planned with these in mind.

Over time, users of the Logical Framework have agreed on a common set of terms. Generally, users adopt a four-level hierarchy of objectives:

Goal - Purpose - Outputs- Activities

The Project Goal:

The project goal is a single statement of the overall development aim of the project. It is a generalized statement of intent and is linked to wider national objectives.

Project Purposes

The purpose is the primary reason for the project. It is related to the problems that the project is designed to address, the developments expected during the life of the project or the situation envisaged at its completion. The purpose is stated explicitly and is not simply a rewording of the goal.

Project Outputs

Project outputs are the direct, identifiable and measurable results expected from the provision of the inputs together with the execution of activities. They are the pre-conditions for the achievement of the project purposes.

Project Inputs and Activities

Project inputs are the resources made available to the project which, together with project activities, allow achievement of the outputs. Inputs may be people, equipment or funds.

Project activities are the discrete tasks undertaken using resource inputs to achieve defined outputs. Observation of the execution of activities forms the basis for performance monitoring.

The Logframe Matrix

The design of the project uses a matrix (Table 1).

- **Narrative Summary**: The objective statements of the project's goal, purposes, outputs, activities and inputs.
- **Objectively Verifiable Indicators**: The indicators for the various levels in the hierarchy specified by quantity, quality and time for achievement.
- **Means of Verification**: Statements of how the information or data are to be collected to record achievements.
- **Assumptions**: The design assumptions made by the project designers.
- **Reference Code**: This code uses a numbering system that links together specific goals, purposes, outputs, activities and inputs.

Once completed, the matrix provides a summary of the project objectives, design logic, anticipated targets and the means of verifying the achievements of targets. Implementation and cost schedules can be easily derived from the narrative summary and objectively verifiable indicators. The logframe will also facilitate identification of project management issues.

Monitoring:

Input-Output Monitoring:

Monitoring may be defined as a measure of a project's implementation efficiency, specifically efficiency in the ways inputs and activities are translated into outputs.

Effectiveness Monitoring:

This type of monitoring looks at the degree to which outputs satisfy the expressed needs of the target population, that is, the transition from output to purpose levels.

Table 1: The Logical Framework Matrix

Ref.	Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
	Goal: The broader objective to which the project will contribute	Indicators of goal achievement	Statement of how data on the goal are to be collected and measured	Assumptions for achieving goal targets
	Purposes: The primary reasons for the project	Conditions that will indicate that the purpose has been achieved: end of the project	How data on purposes will be collected and measured	Assumptions for achieving purposes
	Outputs: The direct measurable results of the project	Magnitude of outputs	How data on outputs will be collected and measured	Assumptions for achieving outputs
	Activities: The main activities that must be undertaken in order to accomplish the outputs	Indicators of successful activity completion	How activity completion is to be measured	Assumptions for activities to be undertaken
	Inputs: The resources made available to the project	Implementation target (type and quantity)	How implementation target will be monitored	Assumptions for providing inputs

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4. Development of a Monitoring Model

4.1 Goals/Targets with Timelines

A monitoring model should provide information that acts as a "snapshot." This snapshot enables the policy maker to comprehend EFA in terms of:

- where we have been,
- where we are, and
- where we are going.

In addition, the monitoring model provides the policy maker with temporal feedback, such as:

- what gains have been made over a prescribed period of time, and
- how long it will take for certain numerical targets to be reached.

In order to describe this snapshot, certain indicators are required. These indicators are the same measures that have been previously identified and described in the strategic plan of action (objectively verifiable indicators). In addition, the plan of action will also describe the means of verification for these indicators. However, when developing a plan of action, it is useful to understand the types of indicators that are available. It is also useful to have a classification of indicators that can be used to monitor different aspects of the education process. Thus, when developing a strategic plan of action, such a classification can show us what should be monitored and how it can be done. There are many ways to categorize education indicators; the classification below represents one approach.

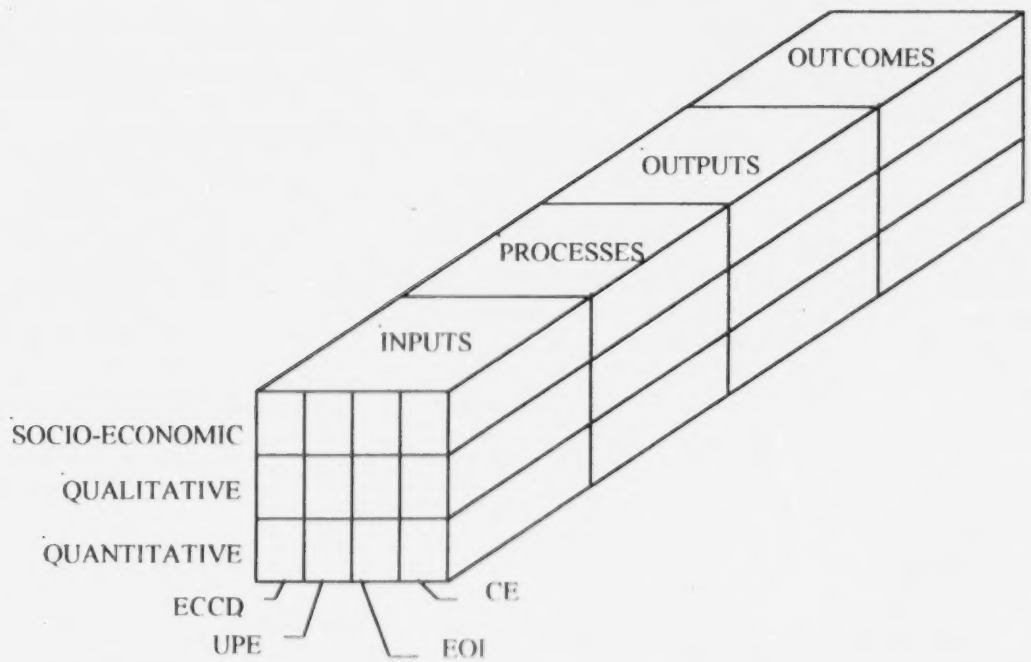
4.2 Classification of Indicators

The classification used in this guidebook uses the model of education as a form of "production." It has four components and has been described earlier in more detail (see Section 1.2.2):

- inputs
- processes
- outputs
- outcomes

Monitoring of the first three components is more popular and frequent because they are readily measurable. However, outcomes are more generalizable and are affected by other variables outside of the education process. As such, they are more difficult to monitor in a way that links them to the education strategic plan. However, there is good research evidence to indicate that a connection between education and such outcomes does exist. Examples of such outcomes include increased earnings, better nutrition, lower birth rates and increased economic development.

Figure 3: Indicators to Monitor EFA



4.3 Concept of Different Levels of Descriptor Clusters

The complexity of the above classification system implies a significant cost for monitoring if all aspects are to be included. In the majority of countries, a complete monitoring system is simply not practical and indeed is not necessary. The tables below separate the above classification into three groups. Level 1 describes the necessary indicators for a basic monitoring system. Level 2 includes additional indicators together with all the indicators included in Level 1. Likewise, Level 3 includes Levels 1 and 2 together with additional indicators. These classifications are but one approach to describing indicators.

The number of indicators for UPE is greater than in the other three areas. This is due to the longer history and greater ease of monitoring formal bureaucratic systems.

	EARLY CHILDHOOD CARE & DEVELOPMENT		
	QUANTITATIVE	**QUALITATIVE**	**SOCIO-ECONOMIC**
LEVEL 1			
Inputs	• No of students • No. of instructors	no data	• Average per-capita income in communities
Processes	• Student/teacher ratio	no data	no data
Outputs	• % of children receiving care and development	no data	no data
Outcomes	no data	no data	no data
LEVEL 2	Level 1 + below	Level 1 + below	Level 1 + below
Inputs	• % of students receiving care	• No. of qualified instructors	• Health and sanitation services available
Processes	• Material availability • Parent involvement in ECCD	• Specialised ECCD materials used in centres	• Communication links between schools and care agencies
Outputs	• % of children going on to primary school	• Progression rates and drop-out rates at primary level	• Private sector involvement in provision
Outcomes	• Decrease in number of malnourished children • Growth in providers	• Sustainability of new centres	• Mortality rates
LEVEL 3	Level 2 + below	Level 2 + below	Level 2 + below
Inputs	• No. parenting courses • Budget as % of total government budget	• % of schools providing ECCD services	• average pc GDP • Community funding of pre-primary
Processes	• Dependency Ratios and Population aged 15-64	• Materials utilised are relevant to local context • % of children with both parents at work	• Parental attitudes to ECCD (girls)
Outputs	• % of students whose development is above average	• Increased health and nutrition	• % of family income spent on child care & development
Outcomes	• Parenting practices • Cognitive, affective and psychomotor development	• Attitudes & behaviours of children	• Social cohesion

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	UNIVERSAL PRIMARY EDUCATION		
	QUANTITATIVE	**QUALITATIVE**	**SOCIO-ECONOMIC**
LEVEL 1			
Inputs	• Enrolments by school • Gender ratios • Progression rate (aggregated) • No. schools • No. teachers	• No. qualified teachers • Unit/cost provided to primary education	• Average per-capita income in communities • Out-of-school population
Processes	• Pupil/teacher ratio • School size • Textbook availability	no data	no data
Outputs	• Pass rates	no data	no data
Outcomes	no data	no data	no data
LEVEL 2	Level 1 + below	Level 1 + below	Level 1 + below
Inputs	• Gross enrolment ratio by district, gender, ethnicity • Progression rates • Expenditure on primary relative to other levels of education	• In-service provision for teachers • Teachers with specialist knowledge areas	• Health and sanitation services available to school and wider community
Processes	• Drop-out rates • Repeater rates • Equipment utilization	• Ease of access to schools • Teacher absenteeism	• Communication links between schools and District Offices
Outputs	• Attainment by student and school characteristics	• Changes in attainment scores over time	• Private sector involvement in provision
Outcomes	• No. of students progressing to secondary education • Employment success	• Success of students during 1st year secondary school • Earnings of graduates	• Economic rates of return for school graduates
LEVEL 3	Level 2 + below	Level 2 + below	Level 2 + below
Inputs	• Net enrolment ratios by district/gender (includes out-of-school numbers) • Non-textbook learning materials availability • Expenditure, current and capital for primary education	• Internal efficiency • Curriculum revisions for local community needs • Subject specializations • Teacher turnover rates • No. of administrative staff	• Average % GDP • Community funding of schools • % of teachers who are from local culture
Processes	• Dependency ratios and population aged 15-64 • Availability of student-centred learning • Contact hours/ week/year	• % of students who have received pre-primary education • Teacher job satisfaction • Parent -school committees • External efficiency	• Parental attitudes to school (girls) • Teacher/community interactions
Outputs	• Student achievement on nationally and internationally standardized tests	• Earnings data from public employment	• School facilities provision (sanitation, walls, etc)
Outcomes	• Minority groups receiving education	• Attitudes and behaviours of school graduates	• Social rates of return of education (girls) • Sustainability of new schools

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	ERADICATION OF ILLITERACY		
	QUANTITATIVE	**QUALITATIVE**	**SOCIO-ECONOMIC**
LEVEL 1			
Inputs	• No. of learning centres • No. of instructors	• No. of qualified instructors	• Per-capita income • Access to formal schooling
Processes	• Learning materials	no data	no data
Outputs	• Graduation rates	no data	no data
Outcomes	• Change to literacy rate for population 15+ yrs	no data	no data
LEVEL 2	Level 1 + below	Level 1 + below	Level 1 + below
Inputs	• No. of learning centres by district	• No. of qualified local instructors • Suitability of centres	• Free time to attend courses • NGO involvement
Processes	• Drop-out rates from courses	• Relevance of learning materials	• Local educational level
Outputs	• Literacy rates	• Functional literacy skills utilized	• Local conditions allow application of new literacy skills
Outcomes	• Literacy rates by gender & district	• Regional disparities in literacy rates	• Economic rates of return
LEVEL 3	Level 2 + below	Level 2 + below	Level 2 + below
Inputs	• Cost of provision, including foregone earnings	• Training of local instructors	• Community participation in educational activities
Processes	• Teacher/student ratio	• Duration and frequency of courses	• Literacy courses in minority languages
Outputs	• Re-enrolments for further literacy courses	• Achievements on standardized literacy tests	
Outcomes	• Incidence of poverty	• Gender disparities in income generation	• Social rates of return

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	CONTINUING EDUCATION		
	QUANTITATIVE	**QUALITATIVE**	**SOCIO-ECONOMIC**
LEVEL 1			
Inputs	• No. training centres • No. of students	• No. of qualified teachers	• Demand for further skills development
Processes	• Student/teacher ratio	no data	no data
Outputs	• Pass rates	no data	no data
Outcomes	no data	no data	no data
LEVEL 2	Level 1 + below	Level 1 + below	Level 1 + below
Inputs	• Literacy skills of learners	• Specialized learning centres	• Community involvement
Processes	• Drop-out rates	• Specialized learning materials	no data
Outputs	• Employment rates	• Community recognises learning	no data
Outcomes	no data	no data	• Increased income
LEVEL 3	Level 2 + below	Level 2 + below	Level 2 + below
Inputs	• Student profile	• % of government budget allocated to CE	no data
Processes	• Relevance of curriculum & materials	• Access to social services • Access to media services	• Private sector develops own CE programs
Outputs	• Transfer to formal sector	• Skills learned are applied	• Poverty incidence
Outcomes	• Labour force participation	• No. of productive citizens	• Unemployment ratio • Economic rates of return

4.4 Scope and Frequency of Measurement

There are a number of alternatives in collecting educational indicators for monitoring purposes. Each has advantages and disadvantages and each differs in the accuracy and generalizability of interpretation possible.

It is important to remember the differences between each of the following three methodologies concerning monitoring policy development and adjustment. While monitoring progress towards EFA based on a total education census examines the impact of policy across the full population, extra care must be taken when using stratified sampling and sentinel site methodology. It is important that personnel involved in strategy implementation are not aware of the composition of the stratified sample or the identity of sentinel sites. Since these methods are being used to sample and monitor the full population, and as a result providing feedback for overall policy adjustment, it is essential that sentinel sites and stratified sampling sites receive the same provision under policy as all other locations. Unless this is ensured, generalized feedback for policy monitoring cannot be reliably undertaken. In other words, the possibility of sentinel sites and stratified sample sites receiving favoured treatment must be avoided.

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Total Education Census

A population census is by definition the total process of collecting, compiling, evaluating, analyzing and disseminating demographic, social and educational data gathered at a specified time. Such a census focuses on the total population of a province or nation. In formal school census procedures, it is often the case that only individuals enrolled in schools are counted. Education monitoring staff rely on other population census data to interpret enrolment rates. Where demographic census data is out-dated, this procedure can result in inaccurate data interpretation and monitoring.

Monitoring of non-formal education and literacy programmes can also take place during a population census.

There are several advantages to population census taking, including:

- Producing a comprehensive and updated database (schools, literacy, non-formal programmes, etc.) for the whole country;
- Providing information on the latest status and development trends in enrolment/progression/literacy, and identifying population sub-groups who are under-enrolled/dropping out/illiterate and their location and characteristics;
- Facilitating an understanding of the accumulated effects of education over time, and shortfalls;
- Helping to interrelate socio-economic factors with education changes;
- Identifying priorities and strategies for EFA;
- Guiding in the planning of EFA strategies;
- Cross-checking data collected through stratified sampling and other approaches;
- Consolidating the efficiency level of statistical work on EFA.

The disadvantages of this approach relate mainly to the scope of a full population census. A full census is expensive to undertake, both for data collection, and analysis and interpretation. The long time frame required to analyze and interpret data makes its usefulness as a monitoring device for policy adjustment minimal. In addition, a full census can produce a database that is so large as to be unmanageable. Even in provinces with relatively small populations, a full census will result in a large database that takes considerable time to analyze. In most cases, this large database must be summarized in some way with averaged data often hiding inter- and intra-district level differences. Statistical procedures allow averages to be used for data interpretation where data are normally distributed. However, in developing countries the data are often highly heterogeneous and thus averaged data can be meaningless. In such cases, policy adjustments on the basis of averaged data may profit nobody.

Stratified Cluster Sampling

Stratified cluster sampling is but one variation of the sampling methodology. There exist a number of different methods that are relevant to different applications. The appropriateness of the method selected relates to:

- the sample size required by the preferred degree of precision,
- the resource cost of each method,
- the time schedule of the study and the time profiles required for the implementation of each method, and
- the size, nature and diversity of the population to be sampled.

Educational experience indicates that stratified cluster sampling is appropriate for monitoring EFA, particularly when carried out in conjunction with regular census taking.

This guidebook is not intended as a step-by-step introduction to stratified sampling methodology. The technique has been widely used and the majority of statistical services available to ministries of education are familiar with its techniques. Included here is a brief summary of the method.

The essential feature of stratified sampling is the division of the population into separate categories or "strata" and the independent selection of sub-samples from each stratum. Examples of strata include types of school, age-groups, localities and socio-economic levels. The proportion of individuals per stratum in the sample should be the same as the proportion represented by that stratum in the total population. Two-stage stratified sampling is appropriate for many developing countries where the sample is stratified on the basis of province and rural/urban population distribution.

The principal advantage of this methodology is the reduction in the size of the sample monitored with a minimal reduction in the precision of data collected. Sample size and precision of data collected are related and one determines the other. However, in terms of cost-effectiveness and speed of monitoring, stratified cluster sampling offers many advantages over census taking.

The reduction in the size of the sample required for monitoring means that educators are more easily able to include non-educational indicators in the monitoring system. As a result, monitoring of qualitative and socio-economic factors is facilitated by this methodology.

Multiple Indicator Surveillance (Sentinel Sites)

This approach consists of a frequent and intensive data gathering from a small number of sites. These sites are selected either as representative (at national or provincial level) samples or because they represent particularly difficult locations. For example, a number of schools may be selected, typically from the overall school census data, because they are typical of most schools in the region under study. On the other hand, the sites selected may represent a sub-section of the region where communities are resistant to EFA and the usual approaches have been unsuccessful.

The small number of sites allows an intensive monitoring exercise to take place. The process is cyclical. Sites are visited, people interviewed, data collected, analyzed and discussed with local stakeholders. A further round of data collection occurs soon after. By examining the analyzed data and discussing the outcomes with local stakeholders and policy makers, people are more likely to understand cause and effect relationships.

This approach can add considerable information and understanding as to the dynamics of achieving EFA and provide rich feedback to policy makers. It also has the advantage of being small scale and thus amenable to a much wider database being monitored. It is this methodology that can best incorporate socio-economic and qualitative indicators. For example, one can gather information about population measures, access to potable water, sanitation, attitudes of fathers to the education of girls, per capita income and other variables.

However, it must be remembered that information from sentinel sites cannot be generalized. Samples such as these have deliberately not been selected to be randomly representative of the target population and therefore cannot be used for making such generalizations. On the other hand, the intensive nature of monitoring facilitates a better understanding of the dynamics of the local context in relation to provincial and/or policy implementation. As such, it provides rich information that can be incorporated into other monitoring processes.

The advantage of monitoring by use of sentinel sites is the richness and variety of data collected, the frequency of data collection and the speed with which data can be collected and analyzed. Such sites also allow monitoring to take place at very low cost. It is possible to monitor sentinel sites two to three times per year, and in difficult locations even more frequently. The disadvantage of the methodology is that the outcomes of monitoring are not generalizable to other sites.

Combination of Methodologies

Each of the above methodologies has its advantages and disadvantages. Census data are accurate but costly and time-consuming to obtain. Stratified cluster sampling is less costly and time-consuming but lacks the accuracy of full census data collection (UNICEF experience in the health sector indicates a possible plus/minus 10% error margin). Sentinel sites provide a richness of data with a quick turnaround time, but with no generalizability.

Monitoring for policy development and adjustment requires a combination of all three methods. Full census data are required to a check the accuracy of stratified sampling techniques, but are not required on an annual basis. Stratified sampling can be used on an annual basis to monitor policy and its results used for policy adjustment. In countries where particularly "difficult" sites exist, sentinel sites can be used in conjunction with stratified sampling. The advantage of using such a combination is its cost-effectiveness. The smaller sample size also allows easier inclusion of non-education variables (demographics and socio-economic variables). Where population growth rates are not accurately known, this is a valuable addition for monitoring EFA.

4.5 Analysis of Indicators

4.5.1 Static versus dynamic monitoring

Once a database of indicators is established, it is a matter of deciding what to analyze and how to present the information to policy makers. Single-figure indicators, such as number of students enrolled or gross enrolment ratios, are of limited value to a monitoring process since they provide little information that is relevant to the question of how much progress is being made to a pre-set target. Rather, dynamic indicators such as growth rates and changes in participation profiles are required to monitor progress toward a target. These dynamic indicators are usually derived by combining in tabular or graphic form two or more indicators and displaying them over a certain period of time.

Knowledge of changes in gross enrolment ratios across a period of time gives a global picture of the change in the number of children enrolled in school. However, it provides little more information than that.

Issues concerning equity and access require an analysis and understanding of more than simply the numbers and percentages of female and male students who are able to enter the school system. The nature of what happens to them during their time in the system is of particular importance. Thus an examination of drop-out rates and functional terminal points is necessary. For example, female students may drop out at a faster rate and/or earlier than males. This will result in males and females receiving unequal contribution from education. Although the statistical data can provide information on these matters, it does not enable any conclusions to be drawn about the reasons for differential drop-out rates and terminal points. However, they do feed back relevant information to policy makers in regard to the impact of their strategies. A greater understanding of the processes occurring within the school and particularly in the classroom is necessary to explain differences.

One method that can be used to examine trends in drop-out rates, female participation and functional "terminal points" is to examine the distribution of students across the various grade levels of the system.

Obviously, not all students who begin school continue through to the end. Many students leave or drop out. Other students will repeat one or more years to either improve their grades, gain a certificate or continue on to the next tier of study.

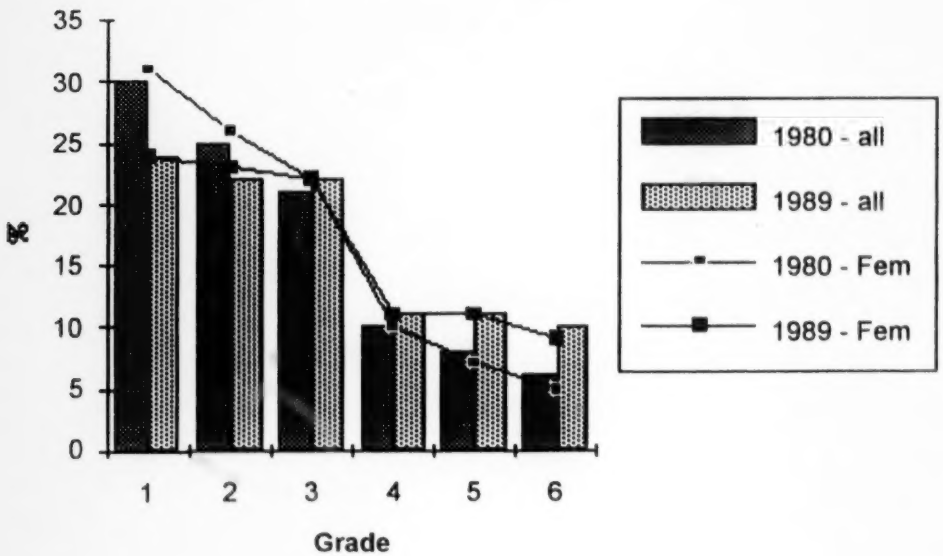
One method that can be used to examine trends in drop-out rates and functional "terminal points," including gender differences, is to examine the distribution of students across the various grade levels of the school system. Functional "terminal points" will include the final year of school but may also indicate other years where significant numbers of children finish their schooling. For example, children who complete five years of primary schooling may do so to progress to the secondary level while the majority finish after three years of schooling. Thus the third year represents a functional terminal point and its "location" or change of location within the structure over time is relevant to planning strategies. An example of this effect is shown below and comes from an Asian developing country (Figure 4).

The figures represent the proportion of the total enrolment at each grade level and are shown for 1980 and 1989. These figures can be used to interpret changes in participation, drop-out rates and gender differences. If additional data are known concerning repeater rates, further interpretation is possible. For example, if all students who commenced Grade 1 continued through to Grade 6 and there were no repeaters or drop-outs, the proportion at each grade would be equal, that is, 16.6%. Likewise, if there is a sudden drop in proportion for one grade from the previous one, this would indicate a functional termination point.

The figure presents data for both males and females together in the form of bar graphs, overlaid by the corresponding line graph data for females. If the line graphs are above the bar graphs, then this indicates that females are over-represented at this grade. If the lines are below the bar graphs, then this suggests under-representation. Changes in these patterns can be identified by examining changes among the 1980 and 1989 graphs.

It is important to remember that these graphs do not indicate the proportion of males and females who enter primary school. Rather, they indicate *what happens* to the students who enter the system.

Figure 4: Distribution of students across grades, an example



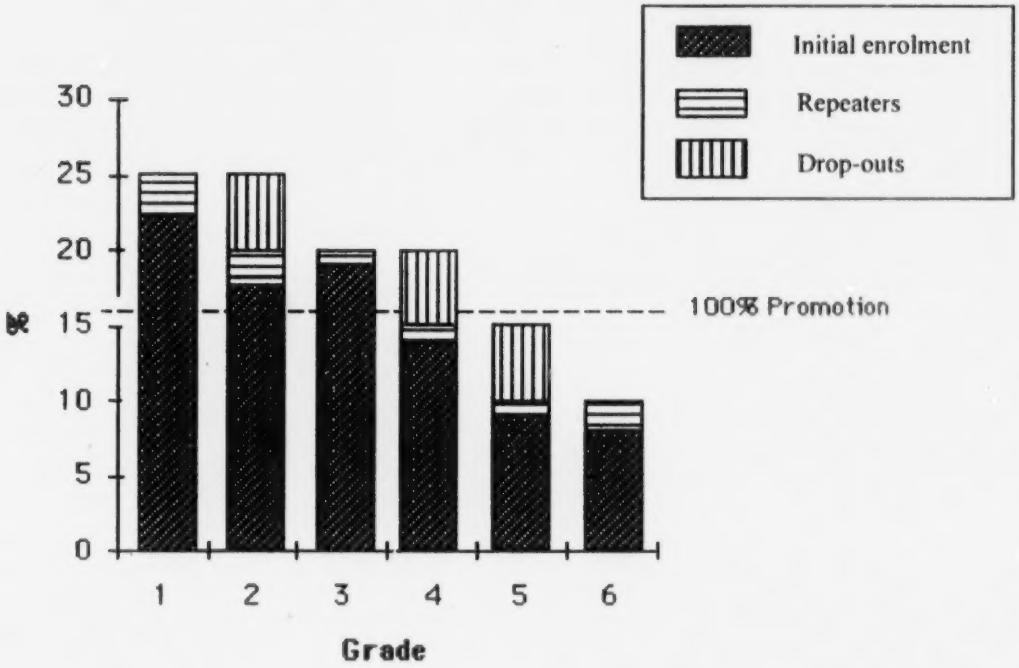
A number of policy interpretations can be drawn from this figure:

- The drop-out rates during the first and last three years have improved dramatically over the time period with negligible drop-out now occurring over the last three years, although it remains a significant issue for females during the last two years. A major improvement in drop-out rates among females in Grades 4 and 5 has been achieved during the decade.
- There appear to be two functional "terminal points" during the period, these being at the end of Grades 3 and 6. However, during the decade, a greater proportion of students is remaining in school to complete the full course.
- There has been an improvement in the representation of females. In 1980, females were over-represented in the first two years but this has almost disappeared by 1990. Females continue to be under-represented in the final grade but are equally represented in Grades 4 and 5; this represents a major achievement over the last decade.

In order to get a complete picture of the state of EFA, a number of different variables are required to describe the dynamics of the system. The problem relates to the difficulty of the sum of the parts not always being equivalent to the whole. We have the parts but need to place them together so that we describe the whole.

An example of graphical information that can be provided to decision makers for policy development and adjustment is as follows:

Figure 5: Description of a system



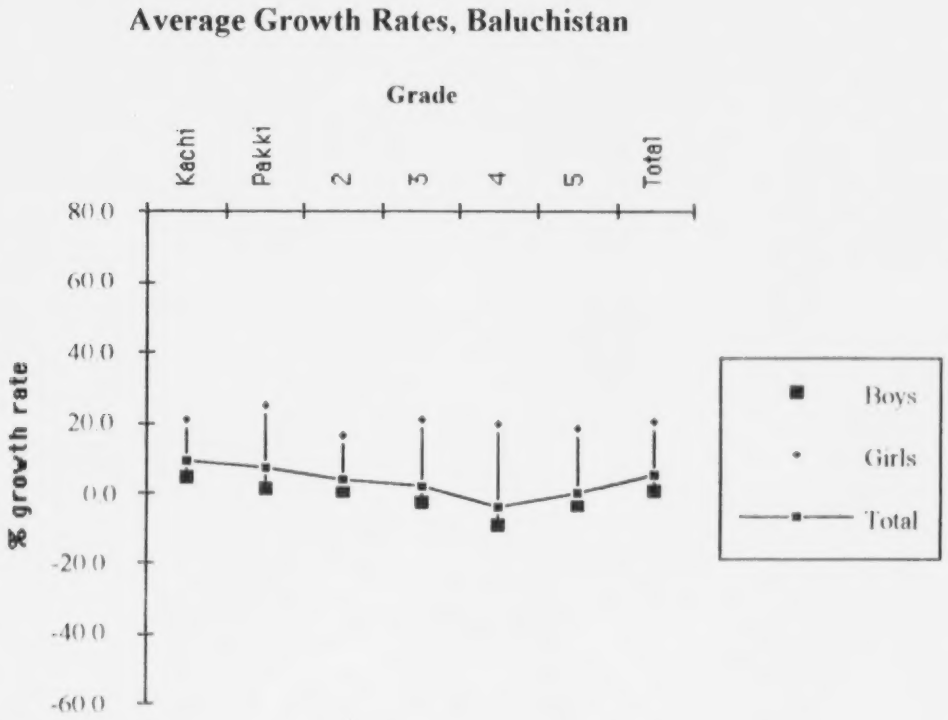
4.5.2 Internal variations

Section 4.4 introduced the issue of the scope and frequency of measurement and briefly raised the issue of internal variation. As was indicated, averages are useful to describe homogeneous populations where indicator data are distributed in a normal manner. However, this is rarely the case in educational contexts within developing countries. In such cases, a reliance on interpretation of averaged data for policy development and adjustment may not be meaningful for any one particular district or school. That is, the average describes no individual district or subdistrict situation. The implication of significant internal variation is that a universal model of educational delivery is not possible, which also implies that a single policy defining EFA may not be possible. It may be that different models are applicable to different provinces, and within a single province different models may be needed among different districts. It is the monitoring system that will identify such variations and provide feedback for multiple policy development, if necessary.

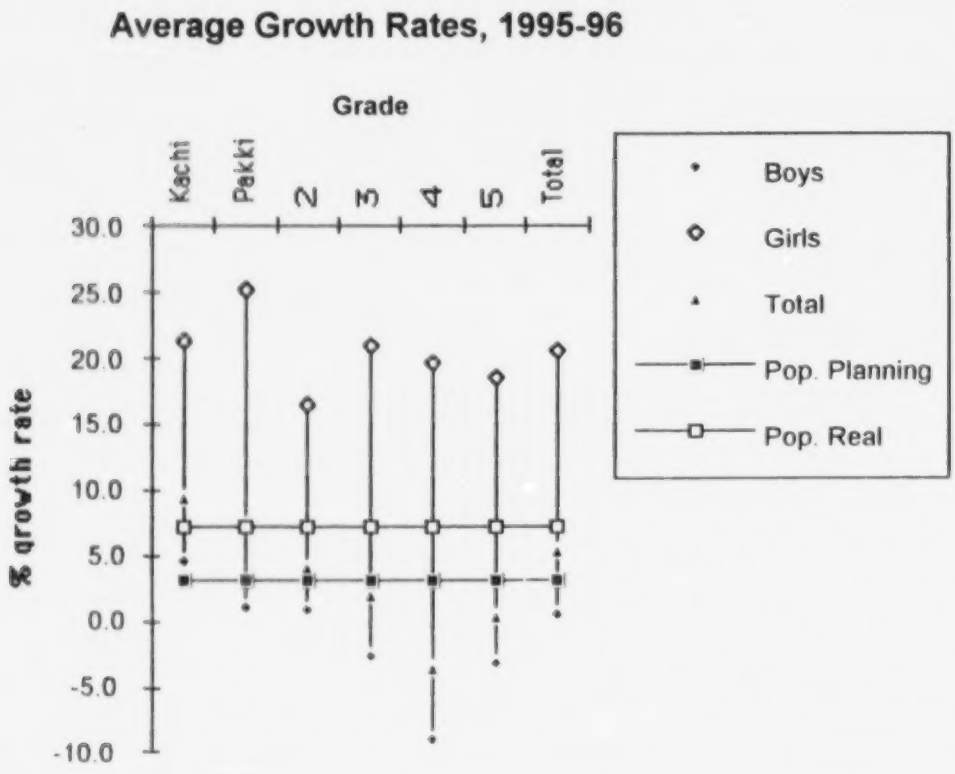
An example, drawn on 10 districts of Baluchistan (a province of Pakistan) follows. The first section describes variation among growth rates. Growth rates are examined by province and 10 districts drawn at random except that the major urban area (Quetta) was deliberately included. Data for girls and boys are separated. The second section describes variation in participation by examining grade distribution for the same districts in 1996.

Growth rates

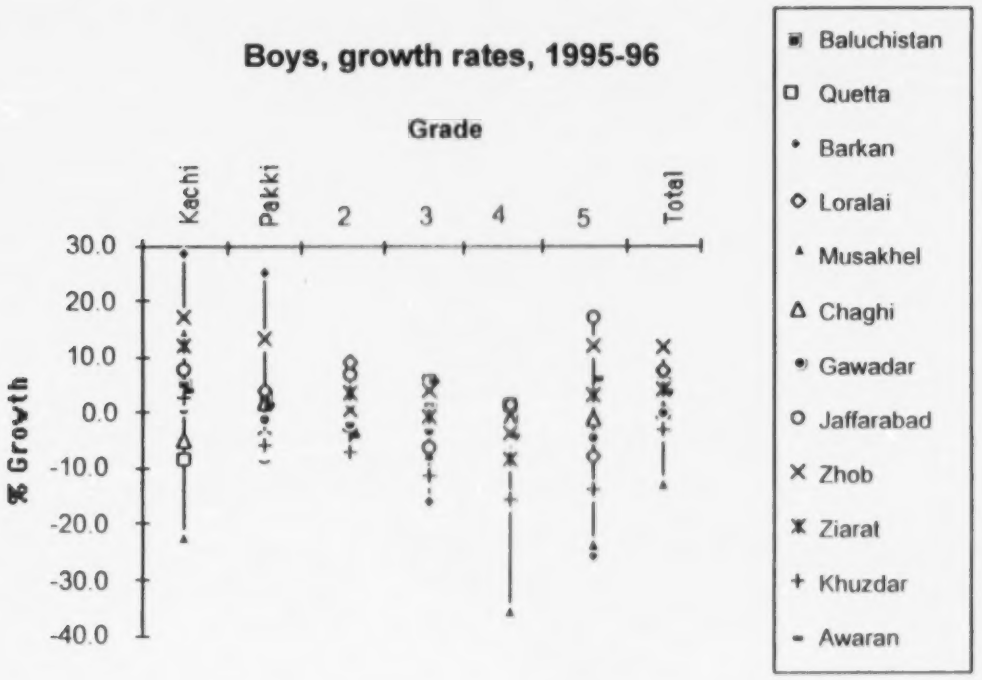
Total average growth rates for the province of Baluchistan are shown below:

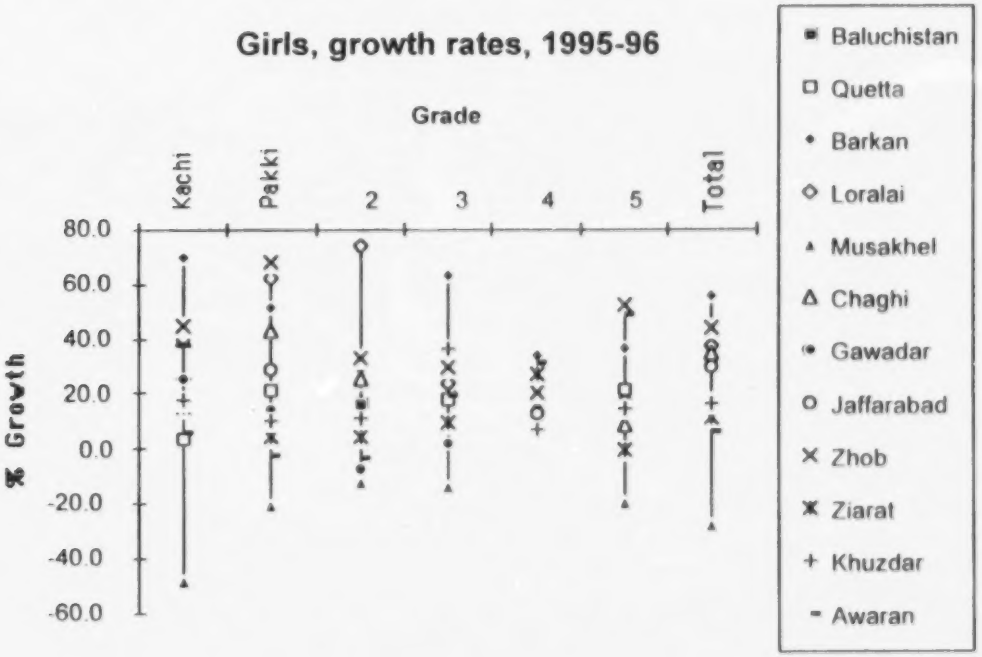


In Pakistan, there has not been a national census since 1981 and population growth continues to be projected from that year. Official policy states that the national average population growth figure of 3.1% is to be used for planning estimates. However, the population growth rate for Baluchistan during the last measured period (1970-81) was 7.1%. The figure below demonstrates the difference between these two rates.



In terms of monitoring EFA, these data reinforce the need for population growth rates to be accurately measured, and for educational growth to be linked to appropriate context measures. The feedback for policy that these data show is clear. There has been an impressive increase in the number of girls enrolling in school and continuing through the primary years but the profile of boy's enrolment is very different. From 1995 to 1996, there has been a smaller growth in the number of boys enrolling in Kachi, Pakki, Grade 1 and the final year of primary school. However, the number of boys enrolling in Grades 3, 4 and 5 has actually decreased to a significant extent. This result has significant implications for EFA and for policy adjustment. The question arises as to why boys' growth rates are at such variance. One way of examining this question is to examine district-level data, separately for boys and for girls. For demonstration purposes, we compare the province average with the administrative centre (Quetta) and 10 districts geographically spread across the province. These data are presented below:


Boys, growth rates, 1995-96
Grade
Kachi
Pakki
2
3
4
5
Total
30.0
20.0
10.0
0.0
-10.0
-20.0
-30.0
-40.0
% Growth
Baluchistan
Quetta
Barkan
Loralai
Musakhel
Chaghi
Gawadar
Jaffarabad
Zhob
Ziarat
Khuzdar
Awaran

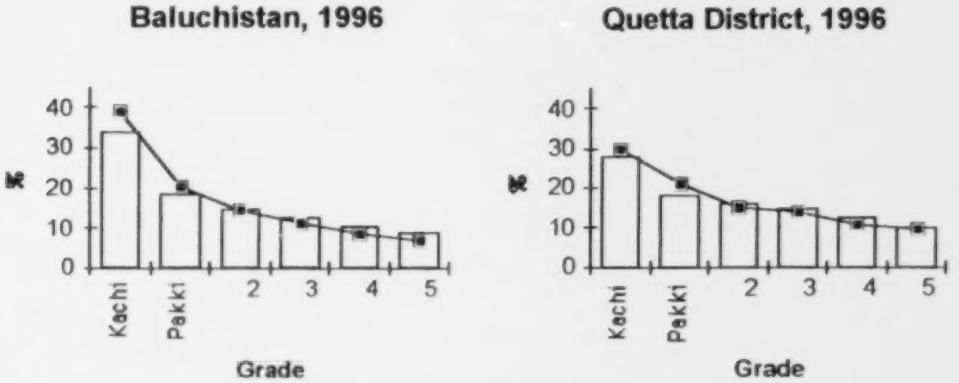

Girls, growth rates, 1995-96
Grade
Kachi
Pakki
2
3
4
5
Total
80.0
60.0
40.0
20.0
0.0
-20.0
-40.0
-60.0
% Growth
Baluchistan
Quetta
Barkan
Loralai
Musakhel
Chaghi
Gawadar
Jaffarabad
Zhob
Ziarat
Khuzdar
Awaran

These data indicate that significant variations are in force across different districts within the province. As such, they provide rich monitoring feedback for policy development and adjustment.

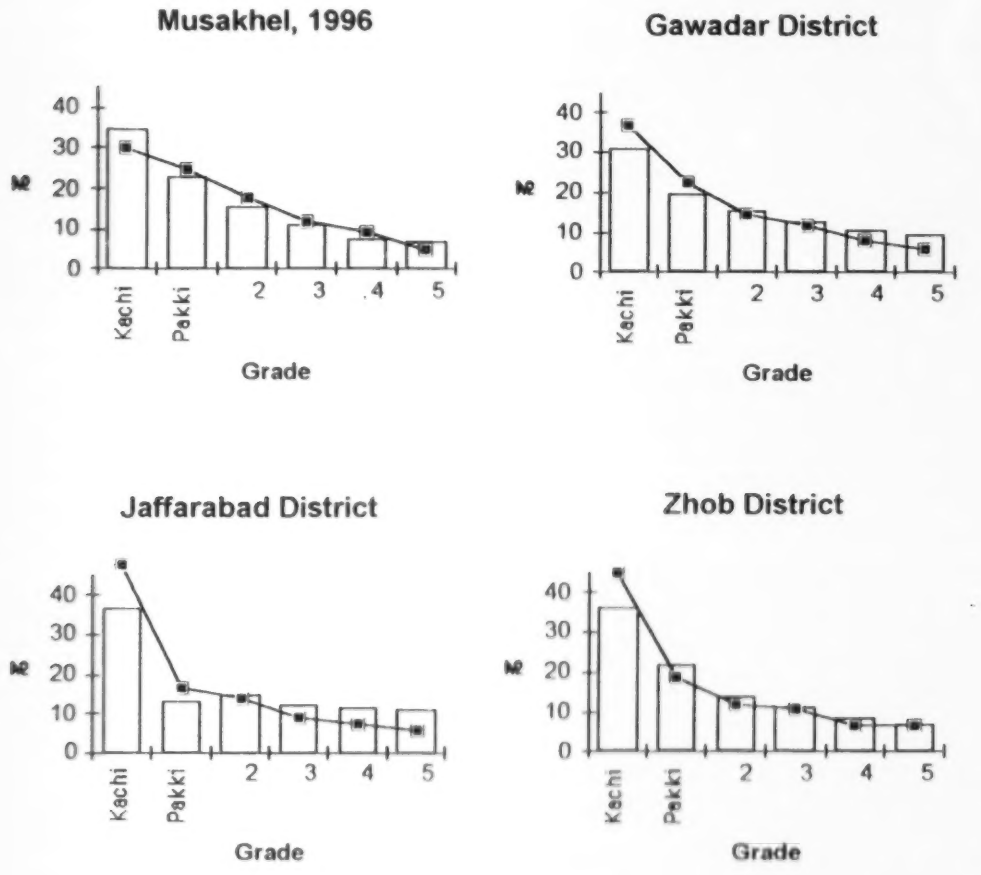
Participation in primary school

As described earlier, graphical representations of the proportion of boys and girls at different grade levels can provide valuable monitoring information for understanding what happens to students once they enter the school system. The variability of processes that was seen with growth rates can be reasonably expected to occur in these data as well. These graphs facilitate the identification of those areas where under- or over-representation of participation by boys and girls is taking place. It also allows us to easily identify where drop-outs are a problem. Some examples of these graphs are presented below. It is worth noting that the "average" data for the province (Baluchistan) does not easily "represent" any district.

The administrative centre, as might be expected in any province which has significant differences between rural and urban areas, is not similar to the "average."



Some other district data are also presented. The major point of interest is the variability of profiles and the processes behind such difference. All provide useful monitoring feedback for policy development.



These examples indicate the usefulness for monitoring of using derived indicators plotted over a second dimension – time or grade level, for example. The examples used here provide monitoring information for access to school and participation in primary schooling. Similar approaches to graphical analysis can be applied to other indicators used for monitoring. The question of which indicators to use will flow from the plan of action if a well-developed strategic plan of action is in place. Once again, this reinforces the importance for monitoring of developing a good strategic plan of action.

5. Implications and Required Linkages

5.1 Legal

Introduction of a monitoring system as proposed above may require changes in the legal framework for data collection in education. Laws and administrative regulations determine the authority of those with monitoring responsibility to carry out their tasks.

The main legal implications are:

- authority to collect data from principals, teachers and others in special cluster surveys and sentinel site surveys
- possible changes needed to the regular education survey
- authority to include additional questions on education in other censuses and surveys (population, labour force, etc.)
- authority to collect data sought from the private sector, including schools or religious bodies
- access to, and (some) usage of, data already collected by the Ministry of Education or other ministries
  - results of national examinations
  - reports of inspectors and supervisors
  - other non-examinations data, e.g., attendance reports
  - administrative reports
- permission to access data from other government agencies, e.g., national directories and statistical reports, sector assessments, population studies
- authority to release data (in some countries, only the central statistics department has the authority to release data)
- ensuring confidentiality to all individuals who provide data
- reduction in the duplication of data collection, where this exists
- publication of an annual monitoring report for wide dissemination

Increased use of modern information technologies and communications technologies will also require some legal changes.

Some of the above factors may be accommodated through ministerial administrative regulations and not require legal changes.

5.2 Planning

5.2.1 Learning from experience

Besides national experience and that of other countries, there exists the relevant experience of international agencies, such as UNESCO, UNICEF and UNFPA. Useful lessons can be learned from experience in the health sector, and from UNICEF's methodologies in that sector.

- In many countries, monitoring has long been a systematic component of the public health system, e.g., to obtain immunization data, indicators of water and sanitation facilities, and data on children in difficult circumstances.
- Such monitoring has been highly decentralized.
- Health workers have been trained to gather information on the spot.
- More reliance is now placed on cluster surveys or on sentinel site surveys with a nationally-designed methodology in order to collect and analyze data quickly.

5.2.2 General considerations

These should always be a focus in planning:

- Establish the monitoring system to provide relevant, needed, accurate and timely information. This may imply a different mix of indicators being used in different provinces and/or districts of a country.
- Co-ordination during all stages and among different units responsible for various planning tasks is critical to the success of a monitoring system.
- Plan for the introduction of information technologies (including their impact on the functioning of monitoring organizations).
- Plan for training implications.
- Avoid duplication of effort, for example, by different departments of the Ministry of Education and/or different ministries.
- Avoid multiplicity of efforts by Government, non-government organizations, and international agencies.
- Simple systems may be more useful in some contexts, especially if they can be used in time in order to make an impact.
- When most of an age cohort is in school, Government interest changes from quantitative to qualitative considerations of education provision.

5.2.3 Process or stages of a monitoring system

A comprehensive, sequential process should be identified. The following can be adapted to each country's situation:

Initial planning

- understand the context (EFA programme objectives, present status)
- analyze current status of EFA policies and targets
- identify unmet needs and emerging problems
- identify types of information needed for informed EFA programme decision-making
- identify target groups to receive and use EFA monitoring data
  - parents and the general public
  - teachers
  - school principals
  - state or provincial officials
  - national officials
- decide on the scope of monitoring
- determine monitoring objectives, and design strategies for each
- identify indicators of education to monitor
- identify cost implications (see below), and secure budget approval
- identify training implications (see below), and conduct necessary training

Data collection

Preparatory steps include:

- standardize terminology
- identify data sources
- conduct awareness campaign
- design survey sample(s)
- design survey instruments (questionnaires), including guidelines and code-book
- test survey instruments

Then:

- conduct survey
- enter data (and verify)

Data analysis

Preparatory steps include determining procedures for:

- data storage
- data coding and verification
- data cleaning
- data aggregation
- data structuring/organization

Then:

- apply statistical tools and methods

Data interpretation, presentation and dissemination

Preparatory steps include:

- establish reporting framework
- select support tools (analysis techniques) to generate information from raw data
- transform data to measurement (value) of indicators

Then:

- generate tables, etc.
- complete data presentation
- refine tables and graphs
- produce other information products (for feedback to users, such as statistical reports, specialized reports)
- publish and widely disseminate a report on the updated indicators to key officials and to the general public

Use monitoring information:

- for review of EFA policies
- for policy dialogue between planners and decision-makers
- for revising the EFA plan of action
- for adjusting the monitoring programme as needed

5.2.4 Costs and financing

Normally, the central Government bears all of the direct costs. Monitoring systems must be cost-effective and responsive to the realities of each country situation. The monitoring system must also be affordable and therefore should be designed that way. The most useful indicators are desired, but they must be relatively easy and inexpensive to generate.

5.2.5 Sustainability of the monitoring system

A constant focus of planning should be to maintain a continuous, solid "virtuous circle" that is self-sustaining.

- As decision-makers find they can use timely monitoring indicators and reports effectively, they will ask for more.
- When planners see that their monitoring work is playing an important role in the decision-making process, they will be more motivated to prepare analytical reports.
- Teachers and school principals who receive useful feedback and who perceive that political leaders and policy advisers are paying attention to monitoring information will be encouraged to contribute again.

5.3 Training Needs

5.3.1 Orientation

All personnel involved in EFA monitoring – political leaders, policy advisers, planners, survey technicians, field supervisors, data collectors, school principals, teachers – should be made aware of the importance of the task and their role within it.

An orientation seminar would seek to increase understanding of:

- EFA objectives and targets, and their importance
- need for accountability
- role and contribution of monitoring, including at the school level
- identification of information needs, and nature of indicators
- interpretation, dissemination and use of monitoring information, and importance of feedback to users
- role of principals and teachers in monitoring

5.3.2 Management of the monitoring system

This includes training that educational planners require to articulate their information needs and their use of monitoring information for decision-making purposes.

- some general planning skills
- conceptual framework of education cost and effectiveness analysis
- some general management skills
- skills for supervising interviewers and other field workers
- communications skills: report writing, persuasive speaking, logic and negotiation
- application of these skills to individual job requirements

Educational planners responsible for monitoring should also be technically skilled research managers.

5.3.3 Specialized technical training

This refers mainly to:

- identification of appropriate indicators for the monitoring system
- stratified sample design
- data collection
- data analysis, including statistical methods
- data interpretation, presentation and dissemination, including report writing

Underpinning these skills in educational research is the ability to use modern information and communications technologies.

- software packages; word processing, spreadsheets and graphics
- computerized database applications and data manipulation procedures
- operation and basic maintenance of computer hardware

5.3.4 Communication and use of information to influence decision-making

Communication seeks to inform and influence decision-makers and policy advisers. The educational planner is an information broker, with a role in applied policy development and analysis to produce information syntheses for policy related decisions. Training in decision-making processes is needed for senior and middle-level educational policy makers.

This training should include

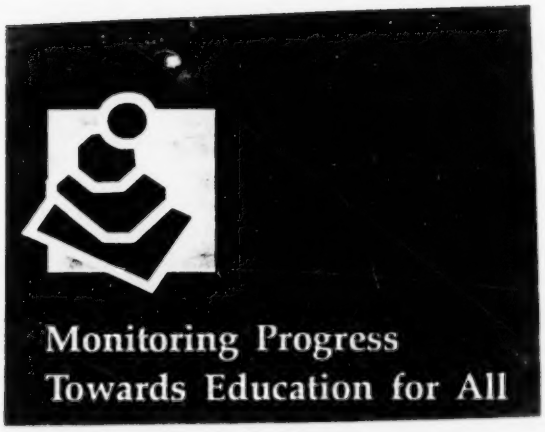
- application of skills, concepts and logic to job requirements
- appropriate and inappropriate uses to which data may be applied

5.4 Information and Communications Technologies

5.4.1 Information technologies

Monitoring information can benefit from computerized spreadsheets, text-processing software and graphic presentation. The design and production of statistical graphics and charts have also become automated with the availability of corresponding computer graphics software. Some software is available that is specifically designed for monitoring. UNESCO-PROAP has produced software relevant to monitoring and is undertaking further software development for monitoring EFA. This software enables the values of indicators to be rapidly calculated and presented in figures or tables. Then the results can be analyzed comprehensively and quickly, and in a manner (format) useful for planners and decision-makers.

Electronic instruments for data collection, such as with questionnaires or forms, are increasingly used. The design of pre-coded questionnaires with closed-end multiple choice questions can easily facilitate the computerized storage and processing of data.



A METHODOLOGICAL GUIDEBOOK